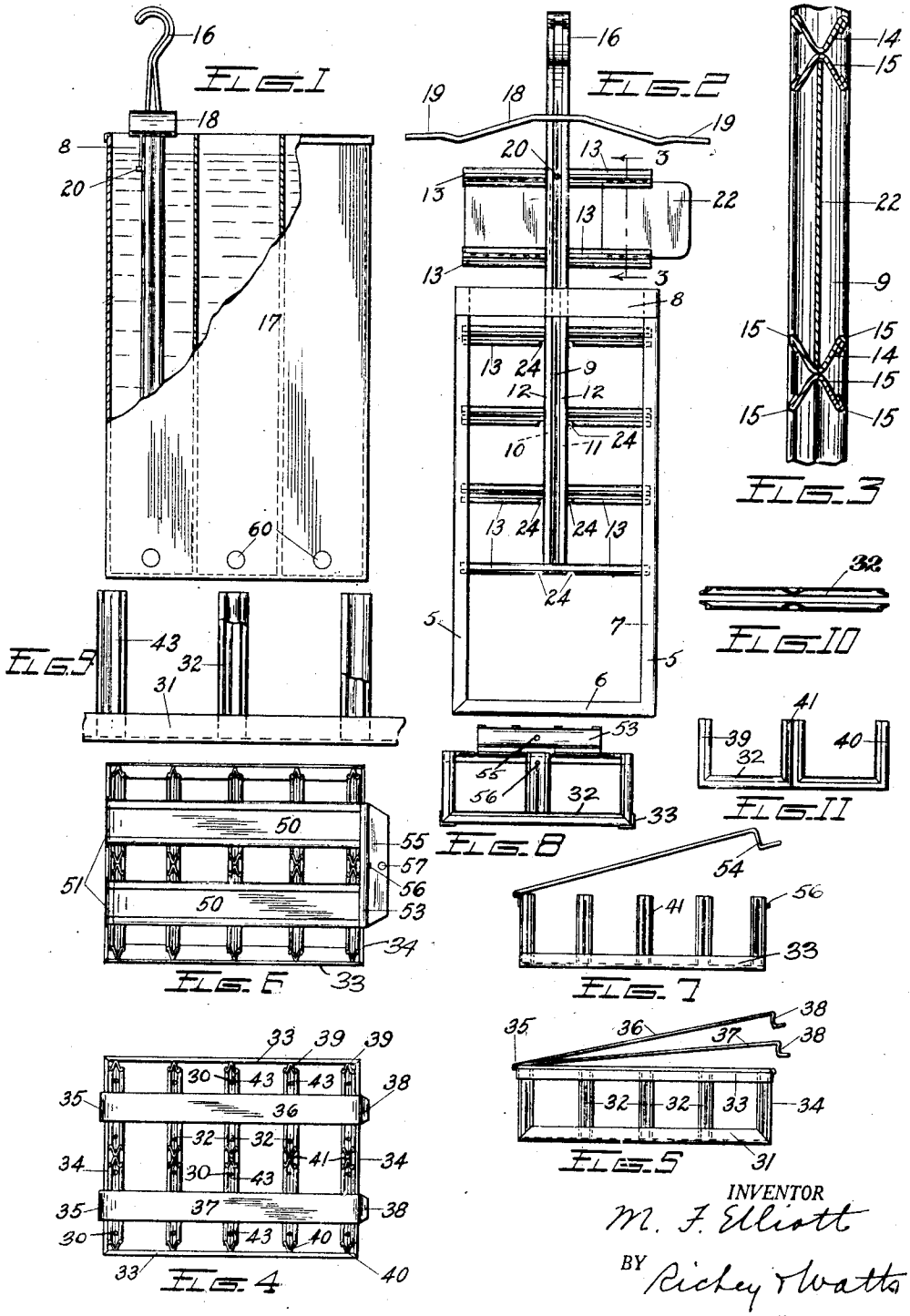
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DENTAL FILM HOLDER

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DENTAL FILM HOLDER

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My invention relates to racks or trays for supporting films or plates such as dental X-ray films for immersion in developing or other liquids.

It usually has been the practice heretofore to support films, particularly dental films, in a tank of developing or other liquid by means of a spring metal clip or other device which of necessity must grip the film to support it. Often it has been the practice of the operator to dip the film into a solution while holding the same between his fingers. Such practices result in disfiguring the film and emulsion when clips are used, since the jaws of such clips are usually toothed to insure a tight grip upon the film while normally supporting the film in the liquid. The films therefore become subjected to finger prints and other defacing marks.

It is an object of my invention to support dental or other films or plates for immersion in a developing liquid without defacing the emulsion on the film and without injury to the film.

Another object of my invention is to support a plurality of films or plates for immersion in a developing solution whereby each film may be subjected to the action of such solution over substantially equal periods of time.

A further object of my invention is to support a plurality of dental or other films for immersion in a solution whereby the films may be left in said support to dry without danger of sticking to the rack or being defaced.

Other objects and advantages of my invention will become more apparent from the following description of several embodiments thereof, reference being made to the drawings which form a part of this specification and in which like reference characters are employed to designate like parts throughout the same.

Fig. 1 is a side elevation of one modification of my invention showing the same immersed in one of the fluid compartments of a developing tank. This view shows the tank partly broken away.

Fig. 2 is a front elevation of the invention forming this modification showing the film holding rack partly withdrawn from the frame.

Fig. 3 is an enlarged section on line 3—3 of Fig. 2.

Fig. 4 is a top plan view of a second modification of my invention.

Fig. 5 is a front elevation of the same showing the film retaining elements partly lifted.

Fig. 6 is a top plan view of a third form of my invention.

Fig. 7 is a side elevation of the same.

Fig. 8 is an end view of the same.

Fig. 9 is an enlarged detail view showing the film guide and retaining members.

Fig. 10 is an unassembled plan view in detail of one of the film holding members used in connection with the forms shown in Figs. 4 to 9, inclusive, and,

Fig. 11 is a detail in elevation of one of the film holding members.

I have provided means for supporting a plurality of dental or other films or plates in a frame whereby the principal surfaces of the films or plates supported thereby may be fully exposed to contact with a liquid in which the supporting means may be immersed, while contact between the supporting means and the principal faces of the films or plates and the consequent marring of these faces due to sticking, etc., is eliminated.

In carrying out my invention and as shown in the drawings, particularly Figs. 1 and 2, which are illustrative of the preferred form of my invention, I provide a substantially U-shaped frame 5 comprising longitudinal vertical arms 5 and a substantially horizontal connecting arm 6, each of the arms 5 and 6 being substantially U-shaped in cross section to provide channels 7 whereby the film

or plate holding rack may telescope within the frame as shown in Fig. 1.

The upper extremities of the arms 5 may be connected by means of a flexible strap 8, preferably formed of non-corrosive spring metal, so that movement of the arms 5 toward each other, as when the frame is held between the fingers and thumb of the operator's hand and pressure is applied to move the arms 5 slightly toward each other, the strap 8 will be flexed outwardly of the frame. The purpose of flexing the strap will be described more fully hereinafter.

The film or plate supporting rack may comprise a central longitudinal stem or body member 9 having substantially V-shaped channels formed longitudinally thereof on opposite sides as at 10 and 11, the respective longitudinal edges of the substantially V-shaped channels being rounded as at 12.

I provide a plurality of oppositely projecting transverse film or plate supporting arms 13, each secured at its inner end to the central longitudinal body member 9. These film supporting arms may be arranged in spaced relation one above the other along the stem 9 and may project on opposite sides thereof as shown more clearly in Fig. 2, the extreme outer ends of the arms on the respective opposite sides of the rack being adapted to extend into and slide within the channels 7 in the respective arms of the U-shaped frame.

Each of the arms 13 is preferably constructed of complementary substantially V-shaped sections 14 and 15, secured together at their bases and having their longitudinal edges 15′ rounded. One manner of securing the sections together is to arrange them so that the arm of one V section forms a V-shaped channel with an adjacent arm of another section for receiving one of the film or plate edges. I may, if desired, also arrange the sections so that the film or plate edge will be received between the adjacent arms of the same V section as shown in Fig. 3. In either event, when the arms are assembled, upper and lower substantially V-shaped channels are formed along the arms. The method of forming the channels as described above may be employed in the construction of the modifications of my invention which are described below.

Referring to Figs. 1 and 2 again, the upper end of the stem 9 extends above the upper pair of transverse arms and terminates in a handle, preferably in the form of a hook 16, whereby the rack may be assembled and disassembled within the frame 5 and whereby the rack together with the frame may be inserted into and removed from a suitable developing tank such as shown at 17, containing suitable developing or other liquid. The tank used in connection with my invention preferably consists of several vertical compartments each containing a different liquid, such as a developing liquid, water and a fixer, although I may employ a plurality of tanks each containing a different solution. I provide means for supporting the rack and frame within the tank which may consist of a cross member 18 secured to the stem 9, its ends extending beyond the outer ends of the arms 13 on either side. The ends of the cross member may be bent as at 19 to provide a flat surface for contacting with certain of the upper edges of the tank walls. It will be noted that when the rack is so supported within the tank or any one of its compartments the bottom arm 6 of the frame is out of contact with the bottom of the tank and the side arms 5 are spaced from the side walls of the tank.

I provide means for locking the rack within the frame which may consist of a pin, or the like, 20 secured to the stem 9 for engagement with the lower edge of the flexible strap 8 as shown in Fig. 1. To release the rack from the frame it is therefore only necessary to compress the arms 5 so that the strap will be flexed whereupon its lower edge will move out of the path of the pin. The rack may then be withdrawn from the frame by pulling upon the handle while holding the frame in the other hand. The operation is reversed in assembling the rack with the frame. The films or plates 22 to be developed may be inserted endwise between the superimposed adjacent channeled arms, the upper and lower edges of the films or plates contacting with the adjacent walls of the channels formed in the respective arms. After the films or plates have been assembled in the rack, the rack may be assembled in the frame as described above.

I have provided drain holes 24 for each of the arms 13 preferably located at the junction of the inner ends of the respective arms with the stem 9, so that the liquid in which the rack is immersed will be drained effectively from the films or plates and from the channels, thus effecting a quicker and more uniform drying of the films after the last bath, and preventing the films or plates from sticking to the channel walls.

In Figs. 4 and 5 I have illustrated a second embodiment of my invention which is preferably in the form of a tray.

In this embodiment, the tray may consist of a frame having longitudinal bottom rails 31 spaced apart by a series of transverse film or plate holding members 32. Upper longitudinal and transverse rails 33 and 34 respectively are provided for reinforcing the frame, one of the transverse members 34 having hingedly connected thereto at 35 a pair of parallel film retaining members 36 and 37 respectively. These retainers extend longitudinally of the tray and are movable independently of each other, the opposite ends being formed to snap over the other transverse rail 34 as at 38. The film or tray holding members 32 shown in detail in Fig. 11,

are formed with outer substantially vertical arms 39 and 40 respectively. Intermediate each of the arms 39 and 40 is another vertical arm 41. It is to be understood that I may employ more than one arm 41, depending upon the width of the tray and the size and number of films or plates I desire to carry in the tray. Each of the arms 39, 40 and 41, together with the transverse member 42 is channeled as at 43 forming a cross section of substantially V-shape for the purpose described in connection with the first embodiment. In the present showing, reference being made to Fig. 4, it will be noted that the film holding members 32 each comprise aligned substantially U-shaped film receiving and holding compartments each compartment having a continuous substantially V-shaped film receiving channel 43. The tray constructed in accordance with this modification of my invention may be immersed bodily into a tank containing developing or other liquids. The tray may be removed from the tank if desired by grasping the side rails 33 with a suitable tool or hook. Drain holes 30 may also be provided in the bottom rails of the film holding members to drain off the excess of liquid from the channels.

In Figs. 6, 7 and 8 I have illustrated another modification of my invention which is similar to that shown in Figs. 4 and 5, except that I have omitted the upper longitudinal members 33 shown in that modification. In the present modification I provide a film or plate retaining element 50 hingedly connected at 51 to the cross member 52 and extending longitudinally of the tray above the film compartments. The free end 53 of the retainer is bent downwardly as at 54 and is apertured at 55. This aperture is adapted to receive a pin 56 secured to an arm 41 whereby the retaining member 50 may be snapped into locked position as shown in Fig. 6. A second aperture 57 is provided in the end 53 whereby the entire tray may be suspended from a hook or other implement into a tank or the like. Drain holes 30 may likewise be formed in the bottom rails of the film holding elements to carry off an excess of liquid that may accumulate in the channels.

It is to be understood that various changes may be made in the construction of the apparatus embodying my invention without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A photographic negative holder, comprising a rack and a support, said rack comprising a plurality of spaced parallel channelled guides adapted to receive a plurality of negatives, said support including a U shaped channel member, the extremities of the guides being disposed in the channel member and being slidable therein to prevent removal of said negatives.

2. A photographic negative holder comprising a rack and a support, said rack comprising a plurality of spaced parallel channelled guides, said support comprising a U shaped channelled member the extremities of the guides being disposed in the channel member and adapted to slide therein into interlocking engagement therewith, to support a negative on all edges.

In testimony whereof I hereunto affix my signature.

M. F. ELLIOTT.